

PATENT COOPERATION TREATY

PCT



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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| Applicant's or agent's file reference PE-Q657 | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416) | |
| International application No. PCT/BR 02/00174 | International filing date (day/month/year) 05.12.2002 | Priority date (day/month/year) 05.12.2002 |
| International Patent Classification (IPC) or both national classification and IPC H04B10/17 | | |
| Applicant ERICSSON TELECOMUNICACOES S.A. et al | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of 9 sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

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|---|---|
| Date of submission of the demand 28.04.2004 | Date of completion of this report 08.04.2005 |
| Name and mailing address of the International preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 | Authorized Officer Shaalan, M Telephone No. +49 89 2399-7723  |

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**International application No. **PCT/BR 02/00174****I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1, 2, 5-18 as originally filed
3, 4, 4a received on 25.10.2004 with letter of 25.10.2004

Claims, Numbers

1-25 received on 25.10.2004 with letter of 25.10.2004

Drawings, Sheets

1/7-7/7 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**International application No. **PCT/BR 02/00174**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|------|
| Novelty (N) | Yes: Claims | 1-25 |
| | No: Claims | |
| Inventive step (IS) | Yes: Claims | 1-25 |
| | No: Claims | |
| Industrial applicability (IA) | Yes: Claims | 1-25 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/BR02/00174

Re Item V**Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Reference is made to the following documents:

D1: EP-A-0883218
D2: US-A-6052218
D3: US-B1-6317254
D4: EP-A-0617527

- 2.1 Document D1, see in particular the passages cited in the search report, discloses as in claim 20 (the references in parenthesis apply to the figures of D1):
a method for optical amplifying comprising the steps of:
directing the optical signals within a first wavelength interval to a first nonlinear optical fibre (250-221);
directing the optical signals within a second wavelength interval to a second nonlinear optical amplifier (250 - 227);
performing first amplification in said first nonlinear optical fibre, by pumping with radiation of a first pump wavelength (245);
performing second amplification in said second nonlinear optical fibre, by pumping with radiation of a second pump wavelength (246);
said first pump wavelength being positioned outside said first wavelength interval and said second pump wavelength being positioned outside said second wavelength interval; and
multiplexing amplified signals from said first and second nonlinear optical fibres from which the subject-matter of claim 20 differs in that

the amplification is performed by parametric amplification.

- 2.2 The problem to be solved by the present invention may therefore be regarded as "which optical amplification mechanism to select in order to improve the reduce crosstalk"
- 2.3 The solution proposed in claim 20 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**International application No. PCT/BR02/00174

None of the documents hint at using a parametric amplifier in a split band structure. The parametric amplifier uses a different idler frequencies in each branch, thereby causing less crosstalk. Since there is a particular advantage in using parametric amplifiers in order to solve the problem solved, namely to reduce crosstalk, the claim is considered as inventive.

3. The subject-matter of independent claims 1 and 17 corresponds to the subject-matter of claim 20, therefore the above argumentation applies mutatis mutandis.